CLAIMS

1. Process for isolating a target biological material contained in a sample, according to which a capture phase is used, said target biological material being placed in contact with at least the capture phase, and the capture phase/target biological material complex is detected,

said process being characterized in that,

the capture phase is in microparticulate or linear form and consists of at least one first particulate or linear polymer, with a hydrophilic apparent nature and first complexing groups, these groups being linked by coordination to a first transition metal, which is itself linked to a first biological species capable of specifically recognizing the target biological material.

2. Process according to Claim 1, characterized in that the capture phase comprises a marker in order to obtain a detection phase.

3. Process according to Claim 1, characterized in that a detection phase is also used, which is in microparticulate or linear form and consists of at least one second particulate or linear polymer, of hydrophilic apparent nature, and second complexing groups, these groups being linked by coordination to a second transition metal, which is itself linked to a second biological species capable of specifically recognizing the target biological material, and a marker.

4. Process according to Claim 1 or 3, characterized in that the first and/or the second polymer is chosen from the group of hydrophilic polymers.

5. Process according to Claim 4, characterized in that the first and/or the second polymer is a functionalized polymer obtained by polymerization of a water-soluble monomer, of acrylamide, of an acrylamide derivative, of methacrylamide or of a methacrylamide

derivative, of at least one crosslinking agent and of at least one functional monomer.

6. Process according to Claim 5, characterized in that the water-soluble monomer is chosen from N-isopropylacrylamide, N-ethylmethacrylamide, N-n-propylacrylamide, N-n-propylmethacrylamide, N-n-isopropylmethacrylamide, N-cyclopropylacrylamide, N,N-diethylacrylamide, N-methyl-N-isopropylacrylamide and N-methyl-N-n-propylacrylamide, the first monomer preferably being N-isopropylacrylamide (NIPAM).

7. Process according to Claim 5, characterized in that the functional monomer corresponds to formula I below:

$$CH_2=C(Z)-(X)_m-(R)_p-(Y)_n \quad (I)$$

in which

Z represents H, a C1-C5 alkyl radical or a benzyl, -COOH or $-CO-NH-CH(CH_3)_2$ radical,

Y represents $-CH_2-COOH$, $-N(CH_2-COOH)_2$, $-N(CH-COOH)(CH_2-COOH)$, or $-N(CH_2-CH_2-NH_2)_2$,

(CH2-COOH)

X represents $-NH(CH_2-CH_2-)$, $-N(CH_2-CH_2-)_2$, $-N(CH_2-COOH)(CH_2-CH_2-)$, or CH(COOH)-,

R represents a linear hydrocarbon-based chain, optionally interrupted with at least one hetero atom such as O or N,

m and p are each an integer which, independently of each other, are equal to 0 or 1, and

n is an integer ranging between 1 and 3.

8. Process according to Claim 7, characterized in that the functional monomer is chosen from carboxylic derivatives, optionally containing nitrogen, itaconic acid, acrylic derivatives and methacrylic derivatives.

9. Process according to any one of Claims 1 to 8, characterized in that the capture phase and/or the detection phase is in microparticulate form and in that the average particle size is not more than 5 µm.

10. Process according to Claim 1, characterized in that the capture phase also comprises a flat or particulate support.

11. Process according to Claim 10, characterized in that the support is particulate and consists of an organic or inorganic, hydrophilic or hydrophobic core.

12. Process according to Claim 11, characterized in that said core is chosen from the group comprising polystyrene, silica and metal oxides.

13. Process according to Claim 11 or 12, characterized in that said core also contains a magnetic compound.

14. Process according to any one of Claims 11 to 13, characterized in that said core is coated with said first polymer, this polymer being linear.

15. Process according to any one of Claims 11 to 13, characterized in that said core is coated with said polymer, said polymer being particulate.

16. Process according to Claim 1 or 3, characterized in that the first and/or the second polymer is poly(N-isopropylacrylamide) and the complexing groups are derived from itaconic acid or from maleic anhydride-cc-methyl vinyl ether.

17. Process according to Claim 1 or 3, characterized in that the first and/or second transition metal is chosen from zinc, nickel, copper, cobalt, iron, magnesium, manganese, lead, palladium, platinum and gold.

18. Process according to Claim 1 or 3, characterized in that the placing in contact of the first biological species with the capture phase and/or the placing in contact of the second biological species with the detection phase is carried out at a pH above or equal to the isoelectric point of said first and second biological species, respectively.

19. Process according to Claim 1 or 3, characterized in that the first and/or the second biological species is rich in histidine and/or cysteine.

20. Process according to Claim 1 and any one of Claims 4 to 19, characterized in that an agglutination reaction is used.

21. Process according to Claim 2 or 3, characterized in that the marker for the detection phase is chosen from the group consisting of an enzyme, biotin, iminobiotin, a fluorescent component, a radioactive component, a chemiluminescent component, an electron-density component, a magnetic component, an antigen, a hapten and an antibody.

22. Process according to Claim 2 or 3 and any one of Claims 4 to 19 or 21, characterized in that the ELISA technique is used.

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23. Phase for capturing a target biological material, characterized in that it is in microparticulate or linear form and consists of at least one first particulate or linear polymer, of hydrophilic apparent nature, and first complexing groups, these groups being linked by coordination to a first transition metal, which is itself linked to a first biological species capable of recognizing the target biological material.

24. Phase for detecting a target biological material, characterized in that it is in microparticulate or linear form and consists of at least one second particulate or linear polymer, of hydrophilic apparent nature, and second complexing groups, these groups being linked by coordination to a second transition metal, which is itself linked to a second biological species capable of recognizing the target biological material, and a marker.

25. Reagent for isolating a target biological material, comprising a capture phase according to Claim 23 and/or a detection phase according to Claim 24.